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ABSTRACT

A comprehensive assessment was made of the status of elementary education in Missouri in reading, mathematics, language, and study skills. The Comprehensive Tests of Basic Skills (CTBS) and the Short Form Test of Academic Aptitude (SFTAA) were administered to a sample of Missouri fourth and sixth graders. For each curricular area, Missouri achievement was compared to the national norm. For reading, math, and language, the achievement of Missouri students was also compared to their anticipated achievement, and the distribution of anticipated achievement in Missouri was compared to the 10-10 distribution of the norm group. Four main conclusions were drawn: (1) students performed at or above the national norms; (2) they generally equaled or exceeded what was expected of them; (3) little relationship existed between school characteristics and achievement; and (4) when the achievement levels of students in the three district classifications (according to size) were compared, no definite trends in achievement across the four curricular areas were apparent. (Author/KM)

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MISSOURI ELEMENTARY EDUCATION

A SUMMARY OF AN ASSESSMENT OF FOURTH AND SIXTH GRADE BASIC SKILLS 1971

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Prepared for the Missouri State Department of Education

by CTB/McGraw-Hill

Department of Programs and Services

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INTRODUCTION

The Missouri State Department of Education (SDE) plays a vital role in the development, support and regulation of educational programs in the state. The broad scope and complexity of SDE's commitments require a periodic definitive assessment of the status (strengths, weaknesses, problem areas, etc.,) of Missouri educational programs. This document summarizes the results of the Missouri Elementary Education Assessment project conducted by CTB/McGraw-Hill for the school year 1970-71. A detailed report of the project has been prepared by CTB/McGraw-Hill for the Missouri SDE. This project complements the 1969-70 study of secondary education and, therefore, completes a statewide perspective of education in Missouri.

The purposes of this project were: 1) to identify those educational factors which are subject to impact by SDE funding or regulation and which require attention to improve educational opportunities for Missouri students and 2) to ascertain the status of Reading, Mathematics, Language, and Study Skills in the elementary schools of the state as recorded by sampling fourth- and sixth-grade students in selected school buildings.

Allocation of categorical funds (state or federal) to support innovative exemplary programs is an important contribution of the SDE to the improvement of education at the local level. To assure the greatest program benefits, in terms of educational achievement at the local level, SDE must have answers to a variety of pertinent questions. For example: What are the characteristics of the districts that need concentrated effort and funding to remedy low achievement? To what degree do these districts need such concentrated support? In what academic areas is support needed? The assessment of elementary education in Missouri provided data to assist in answering these and similar questions and, thus, give substance to the decision-making functions of the SDE.

STUDY DESIGN

Instruments

Two instruments were administered concurrently to acquire the data needed for this assessment: 1) the *Comprehensive Tests of Basic Skills* (CTBS) and 2) the *Short Form Test of Academic Aptitude* (SFTAA).

Sample Size

The design of the study stipulated that at least 10% of the fourth- and sixth-graders in at least 8% of the Missouri elementary schools were to be selected as the sample for this study. Actual sample sizes very closely approximated these criteria. Schools were randomly selected within two parameters: 1) district classification (A, AA, and AAA) and 2) relative size (large, medium, and small) of the district within each classification.

Procedures

The project was announced to state educators and the public by the Missouri State Department of Education. A local representative was designated in each district to handle all on-site aspects of the project. Ten workshops in test administration were conducted for SDE and local personnel by a CTB/McGraw-Hill evaluation consultant prior to the testing which occurred in March 1971.

Analyses

Data from the testing were analyzed to give a comprehensive assessment of

the status of elementary education in Missouri in Reading, Mathematics, Language, and Study Skills. The data were analyzed in the following ways:

1. The achievement of Missouri elementary students, as measured by the CTBS, was compared to the national norms for this test.

2. The achievement of the Missouri students, as measured by the CTBS, was compared to their anticipated achievement.

   The students' expected levels of performance (anticipated achievement) were predicted from scores on the *Short Form Test of Academic Aptitude* as well as from other factors, such as grade, age, and sex and were reported in Anticipated Achievement Grade Equivalent (AAGE) units.

   These AAGE's were then compared to the students' obtained grade equivalents on the CTBS to identify students whose obtained achievement is above, at, or below their anticipated achievement.

3. The distribution of students scoring above and below their anticipated achievement was compared to the distribution of students in the norm grou who scored above and below their expected level of performance.

   If the Missouri distribution were like that of the norm group, 10% would score significantly above anticipated achievement and 10% would score significantly below. This pattern of scores is called the "10-10 distribution."

   Provided that favorable comparison with the norm group is the criterion for success, positive trends would be reflected in a Missouri distribution with more than 10% scoring above and/or less than 10% scoring below their anticipated achievement. On the other hand, negative trends would result if less than 10% score above and/or more than 10% score below.

Data from the testing and information about school characteristics were also analyzed to determine how the characteristics relate to achievement and to anticipated achievement. Thirty-three school characteristics were selected for this study and information about them was obtained from data provided by the SDE and from questionnaires filled out by selected schools.

A WORD OF CAUTION

While inferences can be drawn to the total Missouri Grade 4 and 6 populations, specific judgments should not be made about a particular school or district. Likewise, assumptions should not be made concerning cause-and-effect relationships. In short, to overgeneralize the findings could lead to erroneous conclusions.

ACHIEVEMENT COMPARISONS

For each curricular area, Missouri achievement was compared to the national norm. For Reading, Mathematics, and Language, the achievement of Missouri students was also compared to their anticipated achievement, and the distribution of anticipated achievement in Missouri was compared to the 10-10 distribution of the norm group. The major unit of measure used in this analysis is the "grade equivalent." For test scores, each tenth of a grade equivalent is equal to one month on the grade equivalent scale. For example, 4.7 is read as fourth grade, seventh month.

Reading

The CTBS Reading Test is divided into two parts, Vocabulary and Comprehension. The Vocabulary section consists of 40 items in which the student indicates his knowledge of the meaning of words in context. The 45-item Comprehension section measures the student's understanding of what he reads. Three scores (Vocabulary, Comprehension, and Total) are reported.

Table 1 compares the Reading achievement of the Missouri students to the national norm. These data reveal a relatively positive condition throughout the state for Grades 4 and 6 in that the Missouri students scored, on the average, one month ahead of the norm group.

Table 2 compares the obtained achievement of the Missouri students with their anticipated achievement and lists the difference between the two. It was found that in Grades 4 and 6, obtained achievement in Reading Total was, on the average, one month in advance of anticipated achievement. The only exception occurred at Grade 6 where average AA performance failed by one month to attain the average anticipated achievement. (See page 3 for a discussion of anticipated achievement.)

Table 3 reports the percentages of students who scored above and below their anticipated achievement in Reading. These percentages are compared with the 10-10 distribution of the norm group. (See page 3 for an explanation of the 10-10 distribution.) The Missouri distribution generally shows positive trends: at Grade 4 for the state, 10% scored above and 8% below; at Grade 6 for the state, 12% scored above with 11% below (slightly too high a percentage, but not high enough for concern).

Table 1

READING ACHIEVEMENT: COMPARISON TO NORM GROUP
[Mean Grade Equivalents (MGE) Reported]

Classification	Skills Area	Grade 4		Grade 6	
		N*	MGE	N*	MGE
A	Vocabulary	1133	4.8	1179	6.6
	Comprehension	1133	5.0	1181	6.6
	Reading TOTAL	1132	4.8	1179	6.6
AA	Vocabulary	912	5.0	973	6.8
	Comprehension	912	5.1	972	6.8
	Reading TOTAL	912	5.0	972	6.7
AAA	Vocabulary	6086	4.9	6158	6.8
	Comprehension	6083	4.9	6159	6.8
	Reading TOTAL	6073	4.9	6154	6.8
All Schools	Vocabulary	8131	4.9	8310	6.8
	Comprehension	8128	5.0	8312	6.8
	Reading TOTAL	8117	4.9	8305	6.7
Norm Group	Vocabulary		4.7		6.6
	Comprehension		4.9		6.8
	Reading TOTAL		4.8		6.7

*N = Number of students participating

Table 2

READING ACHIEVEMENT: COMPARISON TO ANTICIPATED ACHIEVEMENT
[Mean Grade Equivalents Reported]

Classification	Skills Area	Grade 4			Grade 6		
		Anticipated	Obtained	Diff*	Anticipated	Obtained	Diff*
A	Vocab	4.6	4.8	+2	6.5	6.6	+1
	Compr	4.8	5.0	+2	6.6	6.6	0
	TOTAL	4.8	4.9	+1	6.5	6.6	+1
AA	Vocab	4.8	5.0	+2	6.8	6.8	0
	Compr	5.0	5.1	+1	7.0	6.8	-2
	TOTAL	4.9	5.0	+1	6.8	6.7	-1
AAA	Vocab	4.8	5.0	+2	6.7	6.9	+2
	Compr	4.9	5.0	+1	6.9	6.8	-1
	TOTAL	4.8	4.9	+1	6.7	6.8	+1
All Schools	Vocab	4.8	5.0	+2	6.7	6.8	+1
	Compr	4.9	5.0	+1	6.8	6.8	0
	TOTAL	4.8	4.9	+1	6.7	6.8	+1

N = Grade 4: A, 1105; AA, 890; AAA, 5878; All Schools, 7873.

N = Grade 6: A, 1158; AA, 952; AAA, 5985; All Schools, 8095.

*Differences are expressed in months. Positive differences indicate performance higher than anticipated and negative differences indicate performance lower than anticipated.

Table 3

PERCENTAGES OF STUDENTS SCORING SIGNIFICANTLY ABOVE AND BELOW THEIR ANTICIPATED ACHIEVEMENT IN READING

Classification	Grade 4		Grade 6	
	% Above	% Below	% Above	% Below
A	11	7	13	12
AA	10	6	10	11
AAA	10	8	13	10
State	10	8	12	11
Norm Group	10	10	10	10

Mathematics

The CTBS Arithmetic Test is divided into three parts: Computation, Concepts, and Applications. The Computation subtest has 48 items equally distributed among the four fundamental operations: addition, subtraction, multiplication, and division. The 30-item Concepts subtest measures the ability of the student to recognize and/or apply the appropriate concept and technique (method, operation, structure, formula, principle). Twenty items are included in the Applications subtest which places emphasis upon problem solving.

Table 4 compares the Mathematics achievement of the Missouri students to the normative sample. These data indicate a positive condition throughout the state although fourth-grade students showed a higher achievement when compared to the national norm than did the sixth-grade students. In Arithmetic Total, Grade 4 Missouri students scored, on the average, 2 months ahead of the nationwide normative sample. In a breakdown by district classification in Arithmetic Total, AAA students scored 2 months ahead of the norm, while A and AA students recorded average performances 4 months in excess of the norm. Grade 6 students matched the norm group in Arithmetic Total, with the A and AAA students equaling norm performance and AA students performing, on the average, 3 months ahead of the norm.

Table 5, which compares obtained and anticipated achievement, shows a favorable performance by students in both grades. (See page 3 for a discussion of anticipated achievement.) Fourth graders throughout the state performed, on the average, 2 months in excess of their expectancies. An analysis by district classification reveals that fourth-grade AAA students scored 2 months ahead, while A and AA scored three months ahead of their anticipated achievement. Sixth graders throughout the state matched their anticipated achievement: A students scored 1 month ahead; AA students scored 2 months ahead; and AAA students scored at their anticipated achievement.

Table 6 compares the percentages of students in the Missouri sample who scored above and below anticipated achievement with the 10-10 distribution of the norm group. (See page 3 for a discussion of the 10-10 distribution.) Positive trends are clear at Grade 4 for the state as 16% scored significantly above and only 6% scored significantly below their anticipated achievement. The sixth-grade distribution for the state exactly matched the norm distribution as 10% scored above and 10% scored below their anticipated achievement.

Table 4

MATHEMATICS ACHIEVEMENT: COMPARISON TO NORM GROUP
[Mean Grade Equivalents (MGE) Reported]

Classification	Skills Area	Grade 4		Grade 6	
		N*	MGE	N*	MGE
A	Computation	1125	5.0	1183	6.8
	Concepts	1125	5.0	1185	6.5
	Applications	1123	4.8	1185	6.7
	Arithmetic TOTAL	1123	5.0	1183	6.6
AA	Computation	900	5.0	970	6.9
	Concepts	899	5.2	970	6.8
	Applications	898	4.9	970	7.1
	Arithmetic TOTAL	897	5.0	969	6.9
AAA	Computation	6074	4.8	6126	6.6
	Concepts	6055	5.0	6124	6.7
	Applications	6028	4.8	6123	6.8
	Arithmetic TOTAL	6014	4.8	6114	6.6
All Schools	Computation	8099	4.9	8279	6.7
	Concepts	8079	5.0	8279	6.7
	Applications	8049	4.8	8278	6.8
	Arithmetic TOTAL	8034	4.8	8266	6.6
Norm Group	Computation		4.6		6.7
	Concepts		4.7		6.5
	Applications		4.7		6.8
	Arithmetic TOTAL		4.6		6.6

*N = Number of students participating

Table 5

MATHEMATICS ACHIEVEMENT: COMPARISON TO ANTICIPATED ACHIEVEMENT
[Mean Grade Equivalents Reported]

Classification	Skills Area	Grade 4			Grade 6		
		Anticipated	Obtained	Diff*	Anticipated	Obtained	Diff*
A	Compu	4.6	5.0	+4	6.6	6.8	+2
	Concepts	4.7	5.0	+3	6.4	6.5	+1
	Applic	4.6	4.8	+2	6.6	6.7	+1
	TOTAL	4.7	5.0	+3	6.5	6.6	+1
AA	Compu	4.7	5.0	+3	6.7	6.9	+2
	Concepts	4.8	5.2	+4	6.5	6.8	+3
	Applic	4.7	5.0	+3	6.8	7.1	+3
	TOTAL	4.7	5.0	+3	6.7	6.9	+2
AAA	Compu	4.6	4.8	+2	6.8	6.6	-2
	Concepts	4.7	5.0	+3	6.5	6.7	+2
	Applic	4.7	4.8	+1	6.8	6.8	0
	TOTAL	4.7	4.9	+2	6.7	6.7	0
All Schools	Compu	4.6	4.9	+3	6.8	6.7	-1
	Concepts	4.7	5.0	+3	6.5	6.7	+2
	Applic	4.6	4.8	+2	6.8	6.8	0
	TOTAL	4.7	4.9	+2	6.7	6.7	0

N = Grade 4: A, 1094; AA, 876; AAA, 5806; All Schools, 7776.

N = Grade 6: A, 1157; AA, 951; AAA, 5918; All Schools, 8026.

*Differences are expressed in months. Positive differences indicate performance higher than anticipated and negative differences indicate performance lower than anticipated.

Table 6

PERCENTAGES OF STUDENTS SCORING
SIGNIFICANTLY ABOVE AND BELOW THEIR ANTICIPATED ACHIEVEMENT
IN MATHEMATICS

Classification	Grade 4		Grade 6	
	% Above	% Below	% Above	% Below
A	16	6	10	9
AA	19	5	14	8
AAA	15	7	9	11
State	16	6	10	10
Norm Group	10	10	10	10

Language

The CTBS Language Test is divided into three parts: Mechanics, Expression, and Spelling. The Mechanics subtest contains 25 items: 13 measure punctuation and 12 measure capitalization. The 30 items of the Expression subtest measure the correctness and effectiveness of expression. The Spelling subtest contains 30 items which measure spelling proficiency. Four scores are reported: Mechanics, Expression, Spelling, and Language Total.

Table 7 compares the achievement of Missouri students to the national norm. The data for Language Total show that Grade 4 students scored, on the average, 1 month in advance of the norm group while Grade 6 students equaled the norm performance.

Table 8 compares the achievement of the Missouri students to their anticipated achievement. These data show that at Grades 4 and 6, the Missouri sample, on the average, exceeded their expected level of performance by 1 month. An analysis by district classification reveals that in both grades in Language Total, student performance from the A schools measured 2 months in grade equivalent units ahead of expected. AAA students measured 1 month ahead, and AA students showed no deviation from the average anticipated score. (See page 3 for a discussion of anticipated achievement.)

Table 9 compares the percentages of students who scored above and below their anticipated achievement with the 10-10 distribution of the norm group. (See page 3 for an explanation of the 10-10 distribution.) In both Grades 4 and 6, at all classification levels, positive trends were indicated by a much larger percentage of students scoring higher than anticipated. Within each level, however, negative trends were also apparent when too large a percentage of students performed lower than anticipated.

Table 7

LANGUAGE ACHIEVEMENT: COMPARISON TO NATIONAL NORM GROUP
[Mean Grade Equivalents (MGE) Reported]

Classification	Skills Area	Grade 4		Grade 6	
		N*	MGE	N*	MGE
A	Mechanics	1130	5.1	1180	7.2
	Expression	1129	4.9	1180	6.6
	Spelling	1130	4.9	1180	6.8
	Language TOTAL	1129	4.9	1180	6.7
AA	Mechanics	911	5.1	971	7.1
	Expression	911	5.0	970	6.9
	Spelling	911	5.0	974	6.9
	Language TOTAL	911	4.9	970	6.8
AAA	Mechanics	6076	5.0	6151	7.2
	Expression	6048	5.0	6152	7.0
	Spelling	6065	5.0	6150	7.0
	Language TOTAL	6036	4.9	6142	6.9
All Schools	Mechanics	8117	5.0	8302	7.2
	Expression	8088	5.0	8302	6.9
	Spelling	8106	5.0	8304	7.0
	Language TOTAL	8175	4.9	8292	6.8
Norm Group	Mechanics		5.0		7.1
	Expression		4.9		6.9
	Spelling		4.7		6.8
	Language TOTAL		4.8		6.8

*N = Number of students participating

Table 8

LANGUAGE ACHIEVEMENT: COMPARISON TO ANTICIPATED ACHIEVEMENT
[Mean Grade Equivalents Reported]

Classification	Skills Area	Grade 4			Grade 6		
		Anticipated	Obtained	Diff*	Anticipated	Obtained	Diff*
A	Mechanics	4.7	5.1	+4	6.7	7.2	+5
	Expression	4.9	5.0	+1	6.6	6.6	0
	Spelling	4.7	5.0	+3	6.5	6.8	+3
	TOTAL	4.7	4.9	+2	6.5	6.7	+2
AA	Mechanics	4.9	5.1	+2	7.0	7.1	+1
	Expression	5.0	5.0	0	7.0	6.9	-1
	Spelling	4.7	5.0	+3	6.9	7.0	+1
	TOTAL	4.9	4.9	0	6.8	6.8	0
AAA	Mechanics	4.8	5.0	+2	7.1	7.2	+1
	Expression	4.9	5.0	+1	6.9	7.0	+1
	Spelling	4.7	5.0	+3	6.9	7.0	+1
	TOTAL	4.8	4.9	+1	6.8	6.9	+1
All Schools	Mechanics	4.8	5.1	+3	7.1	7.2	+1
	Expression	4.9	5.0	+1	6.9	7.0	+1
	Spelling	4.7	5.0	+3	6.8	7.0	+2
	TOTAL	4.8	4.9	+1	6.8	6.9	+1

N = Grade 4: A, 1103; AA, 889; AAA, 5853; All Schools, 7845.

N = Grade 6: A, 1159; AA, 951; AAA, 5965; All Schools, 8075.

*Differences are expressed in months. Positive differences indicate performance higher than anticipated and negative differences indicate performance lower than anticipated.

Table 9

PERCENTAGES OF STUDENTS SCORING SIGNIFICANTLY
ABOVE AND BELOW THEIR ANTICIPATED ACHIEVEMENT
IN LANGUAGE

Classification	Grade 4		Grade 6	
	% Above	% Below	% Above	% Below
A	15	12	18	13
AA	13	16	16	17
AAA	14	13	17	15
State	14	13	17	15
Norm Group	10	10	10	10

Study Skills

The CTBS Study Skills section consists of two parts: Using Reference Materials (20 items) and Using Graphic Materials (30 items). The Reference Materials section involves knowledge of the use of a library, and scores could be highly affected by the absence of a library in a school. The Graphic Materials test involves map reading and interpretation of diagrams, graphs, charts, and tables.

Fourth graders in each district classification scored, on the average, above norm performance for the Study Skills Total. The state exceeded norm scores by 2 months in grade equivalent units. Generally superior performances in the Graphic Materials section accounted for the positive picture. Average scores in the Reference Materials section by the A schools were 2 months behind the norm.

Sixth graders across the state exceeded norm scores for Study Skills Total by 2 months in grade equivalent units. On the average, however, the students in the A schools were 1 month behind norm performance; the AA students exceeded the norm by 1 month; while AAA students were 3 months ahead of the norm. On the Reference Materials subtest, average performance for students in the A schools was 3 months behind the norm, while the performance of AA and AAA students exceeded the norm.

RELATIONSHIPS BETWEEN SCHOOL CHARACTERISTICS AND ACHIEVEMENT

A correlational analysis was used to identify possible relationships between characteristics of the schools, listed in Table 10, and achievement test scores. This analysis revealed very little relationship at either grade between achievement and the vast majority of the school characteristics. Nevertheless, the data would support the following statements:

1. Little, if any, relationship exists between achievement and district classification. However, those schools that are part of the larger districts tend to score less well.

2. At Grade 4, those schools with higher teacher qualification indices tend to show higher achievement.

3. Schools whose student-teacher ratio allows for somewhat smaller classes tend to show higher achievement.

4. The amount of money spent per student is not related to achievement.

5. Little relationship exists between school achievement levels and the number of supportive services offered in the schools (although Grade 4 Reading scores tend to be somewhat higher in schools with such services).

6. At Grade 4, those schools having access to social workers and psychologists tend to have lower achievement levels.

7. The following slight tendencies concerning major classroom organization within buildings were indicated:

   a. Those buildings with graded, self-contained units at the primary levels tend to be those with higher fourth-grade achievement levels. (Of the 137 schools sampled, 102 were in this category.)

b. The 25 schools indicating that their primary levels were of a non-graded, self-contained nature tended to do less well than the others.

c. There were 103 schoools which specified that the main organizational unit at the intermediate grades was the graded, self-contained unit. These tended to do less well than the others.

The above statements were based upon rather low but existent correlation levels. In summary, the conclusion may be drawn that the majority of school characteristics studied in this assessment do not have a relationship to the level of school achievement. *Once again, refer to the word of caution about overgeneralizing the findings (Page 4).*

Table 10

LIST OF SCHOOL CHARACTERISTICS

1. District Classification
2. District Enrollment
3. School Enrollment
4. Teacher Qualification Index (Based upon degrees and experience)
5. Pupil/Teacher Ratio
6. Adjusted Valuation Per Child
7. Per Pupil Expenditure
8. Guidance Hours Per Week
9. Nurse Hours Per Week
10. Librarian Hours Per Week
11. Audio-Visual Coordinator
12. Social Worker
13. Psychologist
14. Number of Building Specialists
15. Number of District Specialists
16. Title I Program
17. Certificated Art Teacher
18. Certificated Music Teacher
19. Certificated P.E. Teacher
20. EMR Program
21. Speech Therapy Program
22. Pre-Kindergarten Program
23. Kindergarten Program
24. Grades 1, 2, 3 Primarily Graded, Self-Contained
25. Grades 1, 2, 3 Primarily Graded, Departmental
26. Grades 1, 2, 3 Primarily Non-Graded, Self-Contained
27. Grades 1, 2, 3 Primarily Non-Graded, Departmental
28. Grades 4, 5, 6 Primarily Graded, Self-Contained
29. Grades 4, 5, 6 Primarily Graded, Departmental
30. Grades 4, 5, 6 Primarily Non-Graded, Self-Contained
31. Grades 4, 5, 6 Primarily Non-Graded, Departmental
32. Principal Certificated
33. Hours as Principal in the School

RELATIONSHIPS BETWEEN SCHOOL CHARACTERISTICS AND ANTICIPATED ACHIEVEMENT

Each school characteristic listed in Table 10 was divided into levels. For example, district enrollment was divided into 5 levels: above 16,750; between 6,001 and 16,750; 1,501 to 6,000; 726 to 1,500; and below 726. The purpose of this phase of the analysis was to determine, for each grade, if disproportionate numbers of students within any given level of a characteristic were significantly above or below anticipated achievement in the area tested. The percentages of students above and below anticipated achievement for each level of each characteristic were compared with those percentages obtained by the entire state sample. The percentages for the statewide sample are presented in Table 11.

Table 11
PERCENTAGES OF MISSOURI STUDENTS WHO PERFORMED ABOVE AND BELOW THEIR ANTICIPATED ACHIEVEMENT

Grade	Reading		Mathematics		Language	
	% Above	%Below	% Above	% Below	% Above	% Below
4	10	8	16	6	14	13
6	12	11	10	10	17	15

As was true of the comparison of school characteristics to achievement, very few relationships were discovered between the characteristics and anticipated achievement. The discussion which follows concerns only those areas in which the percentages of students within levels of a characteristic departed significantly from those reported for the state in Table 11. If the characteristic is not discussed here, it may be assumed that no significant departure from the statewide percentages was observed.

District Enrollment

Reading. Positive departures from the Grade 6 state distribution of percentages were observed in districts of 1,501 to 6,000 student population (14% above -- 7% below anticipated achievement).

Mathematics. A negative departure from the state distribution was observed in Grades 4 and 6 in districts with a student population over 16,750 (9% above -- 9% below). However, a positive departure occurred in Grade 4 in smaller districts of up to 6,000 students (18% above) and in Grade 6 in districts with 725 to 1,500 students (14% above -- 4% below).

Language. A negative departure from the state distribution was observed in districts with 6,000 to 16,750 students (Grade 4, 16% below; Grade 6, 14% above -- 19% below). A positive Grade 6 departure was observed in districts with 1,501 to 6,000 students (19% above -- 12% below).

School Enrollment

Reading. A positive departure was noted in Grade 6 in schools with 335 to 495 students (8% below anticipated achievement).

Mathematics. A slightly positive departure was noted in Grade 4 in schools with up to 335 enrollment (18% above -- 5% below).

Language. Grade 6 students in schools with from 335 to 495 enrollment showed a positive departure (12% below).

Teacher Qualifications

Mathematics. There was a definite trend at Grade 4 for children in schools with a higher teacher qualification index to score *above* anticipated achievement. In the four levels from most qualified buildings to least qualified buildings (relative to amount of education and experience), the percentages *above* anticipated

achievement ranged from 20% in the most qualified buildings to 12% in the least qualified buildings.

Student/Teacher Ratio

Reading. A negative departure was observed in Grade 4 in buildings with a greater than 30:1 ratio (7% above anticipated achievement). In Grade 6, however, a positive departure was noted for this ratio (15% above).

Mathematics. A negative departure was observed in Grade 4 in buildings with a high student/teacher ratio (10% above). At Grade 6, however, a positive departure was noted (only 6% below).

Language. A negative departure was observed in buildings with a high (greater than 30:1) ratio in Grade 4 (11% above), but in Grade 6 a positive trend was noted for this ratio (only 12% below).

Number of In-Building Specialists (Librarian, Art Teacher, Guidance Personnel, etc.,)

Mathematics. In buildings with fewer than 3 specialists, Grade 6 students recorded a positive departure (13% above -- 7% below anticipated achievement).

Language. A positive departure was also noted for this subject at Grade 6 in buildings with fewer than 3 specialists (20% above -- 12% below).

Number of District Specialists (Social Workers, Psychologists, Speech Therapists and EMR Specialists)

Reading. In districts with the maximum number of specialists (four), a negative departure was observed in Grade 4 (7% above anticipated achievement), while a positive departure was noted in Grade 6 (8% below).

Mathematics. In districts with the maximum number of specialists (four) a very negative departure was observed in Grade 4 (7% above -- 9% below).

Language. In districts with four specialists, Grade 4 students showed a negative departure (9% above), while Grade 6 students showed a positive departure (11% below). In Grade 6, in districts with only 3 specialists, a negative departure was noted (18% below).

Major Classroom Organization

For these analyses, each major type of classroom organization was compared against the other types to determine if the distribution of students scoring above and/or below their anticipated achievement was related to the organization of classrooms at various educational levels within a school.

Graded, Self-Contained (Primary). More Grade 4 and 6 students in schools with graded, self-contained classrooms at the primary level tended to score above anticipated achievement than those in schools with other types of classroom organization. However, more students in schools with graded self-contained classrooms also tended to score below anticipated achievement than those students in schools with other types of classroom organization. Therefore, these data indicate both positive and negative trends for schools with graded, self-contained classrooms at the primary level.

Graded, Self-Contained (Intermediate). A negative trend was noted at Grade 4 since slightly fewer students in schools of this organizational type scored above anticipated achievement. However, in Grade 6, a slightly positive trend for this type was noted.

Graded, Departmental (Intermediate). At Grade 4, more students in schools with this organizational type scored above anticipated achievement than those in schools with other organizational types.

Non-Graded, Self-Contained (Primary). In comparison with other types, proportionately fewer students in schools with this organizational type scored above *and* below their anticipated achievement.

POSSIBLE PROBLEM AREAS

Although the Grade 4 and Grade 6 students performed quite favorably, some possible needs were identified as a result of an analysis of *subtest* scores within each of the major curricular areas. These needs are discussed below.

Reading

1. Grade 4 and 6 students outperformed the norm group by 2 months in Vocabulary but only equaled norm performance in Comprehension.

2. About twice as many Grade 4 students were below anticipated achievement in Comprehension as in Vocabulary.

3. About 13% of the Grade 6 students were below expectation in Comprehension, whereas only 9% were below in Vocabulary.

Mathematics

1. Although in excess of the norm, Grade 4 students performed less well, on the average, in application of Mathematics knowledge to a practical situation than in Computation and Concepts tasks.

2. More AAA students than would be expected performed below anticipated achievement on the Computation subtest.

Language

1. Students in Grades 4 and 6 performed much better on the Spelling subtest than on the Mechanics or Expression subtests.

2. At Grades 4 and 6, more students than would be expected were below anticipated achievement for the Expression subtest.

3. Grade 6 students from A classification schools were, on the average, 3 months behind norm on the Expression subtest.

Study Skills

1. Students in Grade 4 schools scored, on the average, 2 months lower than the norm on the Using Reference Materials subtest.

2. Grade 6 students from A classification schools scored, on the average, 3 months lower than the norm in the Using Reference Materials subtest.

ANALYSIS SUMMARY

A tabular presentation of the results of this study is provided in Table 12. Under column 1 of each curricular area, Missouri achievement is presented as a difference from the norm. These are grade equivalent differences and are expressed in months. A "+" indicates that the Missouri sample performed favorably in relation to the norm and a "-" indicates that the Missouri sample failed to equal norm performance by the number of months indicated. For example, consider the Grade 4 AA students in Reading. Under column 1, it will be observed that these students scored an equivalent of 2 months in advance of the norm.

Column 2 contains grade equivalent differences, expressed in months, between the Missouri students' obtained achievement and their own anticipated achievement. (See page 3 for a discussion of anticipated achievement.) A "+" indicates that the sample group exceeded their anticipated achievement while a "-" indicates that they failed to equal their anticipated achievement. For example, consider Grade 6 AAA students in Language. Under column 2 it will be observed that these students scored an equivalent of 1 month in excess of their own anticipated achievement.

Column 3 contains differences between Missouri and the norm group expressed in percentages of students who performed significantly above and below anticipated achievement. (See page 3 for a discussion of 10-10 distribution.) A "+" favors the Missouri group. A "-" favors the norm group. For example, consider Grade 6 A students in Reading. Under column 3 it will be noted that 3% more Missouri students scored significantly *above* their anticipated achievement than did the norm group (a positive distribution for Missouri). It will also be noted that 2% more Missouri students scored *below* anticipated achievement than did the norm group (a negative distribution). *Once again, note the word of caution (page 4) against overgeneralizing these findings.*

ANALYSIS SUMMARY

COMPARISONS OF:
1. Missouri Achievement to Norm Achievement
2. Missouri Achievement to Anticipated Achievement
3. Missouri Percentages Above and Below Anticipated Achievement to Norm Percentages

Classification		Reading				Mathematics			
		Mo. vs. Norm	Mo. Ach. vs. Ant.	Mo. %ages vs. Norm		Mo. vs. Norm	Mo. Ach. vs. Ant.	Mo. %ages vs. Norm	
		1	2	3 Above	Below	1	2	3 Above	Below
Grade 4	A	0	+1	+1	+3	+4	+3	+6	+4
	AA	+2	+1	0	+4	+4	+3	+9	+5
	AAA	+1	+1	0	+2	+2	+2	+5	+3
	State	+1	+1	0	+2	+2	+2	+6	+4
Grade 6	A	-1	+1	+3	-2	0	+1	0	+1
	AA	0	-1	0	-1	+3	+2	+4	+2
	AAA	+1	+1	+3	0	0	0	-1	-1
	State	+1	+1	+2	-1	0	0	0	0

Classification		Language				Study Skills
		Mo. vs. Norm	Mo. Ach. vs. Ant.	Mo. %ages vs. Norm		Mo. vs. Norm
		1	2	3 Above	Below	1
Grade 4	A	+1	+2	+5	-2	+2
	AA	+1	0	+3	-6	+2
	AAA	+1	+1	+4	-3	+3
	State	+1	+1	+4	-3	+2
Grade 6	A	-1	+2	+8	-3	-1
	AA	0	0	+6	-7	+1
	AAA	+1	+1	+7	-5	+3
	State	0	+1	+7	-5	+2

Column 1 for each subject: These numbers represent differences in months between average grade equivalents for Missouri and Norm. A "+" favors Missouri.

Column 2 for each subject: These numbers represent differences in months between average grade equivalents for Missouri Obtained and Anticipated Achievement. A "+" favors Obtained.

Column 3 (above, below) for each subject: These numbers represent differences between Missouri and the Norm in percentages of students significantly above and below Anticipated Achievement. A "+" favors Missouri.

CONCLUSIONS

Four main conclusions can be drawn from the results of this assessment:

1. The Missouri students performed, for the most part, at or above the national norm.

2. The Missouri students generally equaled or exceeded what was expected of them.

3. Little relationship existed between school characteristics and achievement.

4. When the achievement levels of students in the three district classifications were compared, no definite trends in achievement across the four curricular areas were apparent.

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